The Equity-Efficiency Tradeoff in Meritocratic College Admissions

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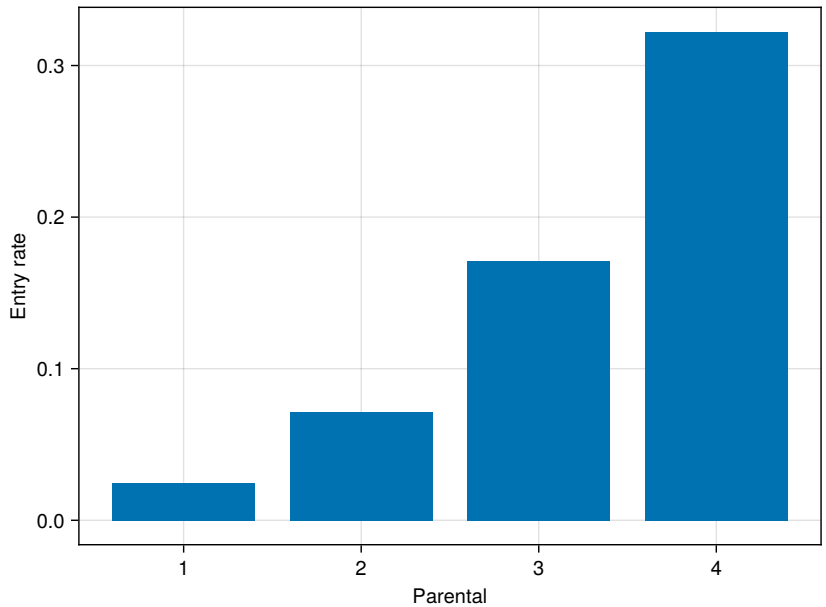
Motivation

Richer HS graduates are far more likely to attend "high quality " colleges than their poorer peers.



Fraction attending "high quality" college by parental income quartile.

NLSY97 data.

Concern: Colleges may "**amplify the persistence of income across generations**" (Chetty et al. 2020)

Our Paper

We study the implications of "**income based admissions**" (IBA)

- Colleges admit low income students at higher rates than similar high income students.
- Similar to Chetty et al.'s "need affirmative" policies.

We ask:

1. Would IBA reduce the income gap in high quality college attendance?
2. How much would IG mobility increase?
3. At what cost?
   Do we lose aggregate human capital and earnings?

What We Do

We build a **quantitative model** that matches variation

- of entry rates, graduation rates, earnings
- across college "qualities"
- across student characteristics:
  parental backgrounds and test scores

Key model features:

- "**Undermatch**:"
  low income students are less likely to attend good colleges
- **Selective admissions** by high quality colleges
- **Complementarity**:
  high ability students gain most from high quality colleges

What We Do

We study the implications of "income based admissions" (IBA)

We assess:

- which students are willing to move "up" (high or low ability)
- where high income displaced students end up
- implications for
  - intergenerational (IG) mobility
  - aggregate earnings / human capital

Key question:

- Can we improve IG mobility without reducing aggregate human capital?
- "Equity-efficiency trade-off"

Results

"Small" scale IBA:

- attract high ability / low income students to good colleges
- displace high income students of lower ability
- aggregate H rises – no trade-off

"Large" scale IBA:

- ability of treated low income students declines
- aggregate H declines
- but aggregate H losses are small

Take-away message:

- Income based admissions **improve IG mobility** at **little or no loss of aggregate earnings**.

Model

Model Outline

We follow one cohort of high school graduates.

Timing:

1. Students draw **endowments** (ability, AFQT, ...)
2. Colleges **admit** students based on observable endowments
3. Students **choose a college** or work as HSG.
   The only decision in this model
4. In each college period:
   Students learn; may drop out or graduate.
5. After college: work
   Lifetime earnings determined by human capital h and degree attainment.

Student Endowments

Initial fixed endowments

- ability a (unobserved by us)
- parental background p, AFQT g (observed)
- preference for each college (flow utility) U_q

Time-varying endowments:

- human capital h_t (unobserved)
- assets k_t (observed)

Colleges

1 two-year college (no graduation possibility)

3 four-year colleges

- quality ranked according to average SATs
- quality 4 includes flagships (UVA, UNC)

Colleges differ in terms of

- human capital production function
- dropout and graduation rates
- finances
- admissions

Colleges

Human capital production function:

$$h' = h(1-\delta) + e^{A(q,a)} h^{\gamma} \tag{1}$$

Productivity $A(q,a)$ with quality / ability complementarity

Dropout and graduation probabilities:

- all functions of ability and year
- matching observed dropout and graduation rates by (q,g,p)

Colleges

Finances:

- Net cost τ, parental transfers z, earnings while in college y
- All functions of (q, g, p) - directly from the data.

Admissions:

- Colleges rank students according to a score
- Score = weighted average of h and AFQT g
- Students choose sequentially in order of score
- Colleges admit students until all seats are filled

College Phase

In each period:

- Learn $\rightarrow h'$
- Consume and borrow $\rightarrow k'$
- Drop out or graduate
  - probability depends on ability, h, quality

If drop out or graduate

- start work with annual earnings $w_s \times h \times f\left(experience\right)$
- wage depends on graduation: w_{SC} or w_{CG}
- standard permanent income problem

Reasons for "Undermatch"

Only 1/3 of top AFQT quartile students enter top colleges.

- "Undermatch"

Why do high ability students attend low quality colleges?

- Idiosyncratic college preferences U_q
- Information friction
- Financial constraints
- Admissions cutoff rules

Admissions mostly depend on h

- Implies advantage for high income students.
- Better college preparation (AP courses, extracurriculars, ...)

Calibration

Calibration

Main data source:

- NLSY 1997
- Geocode data
- Official transcripts.

Plus quasi experimental moments.

44 calibrated parameters.

Target Moments: Overview

HS grad characteristics:

- joint distribution of AFQT / parental

College entry patterns by (q,g,p)

Net college **costs** and parental **transfers** by (q,g,p)

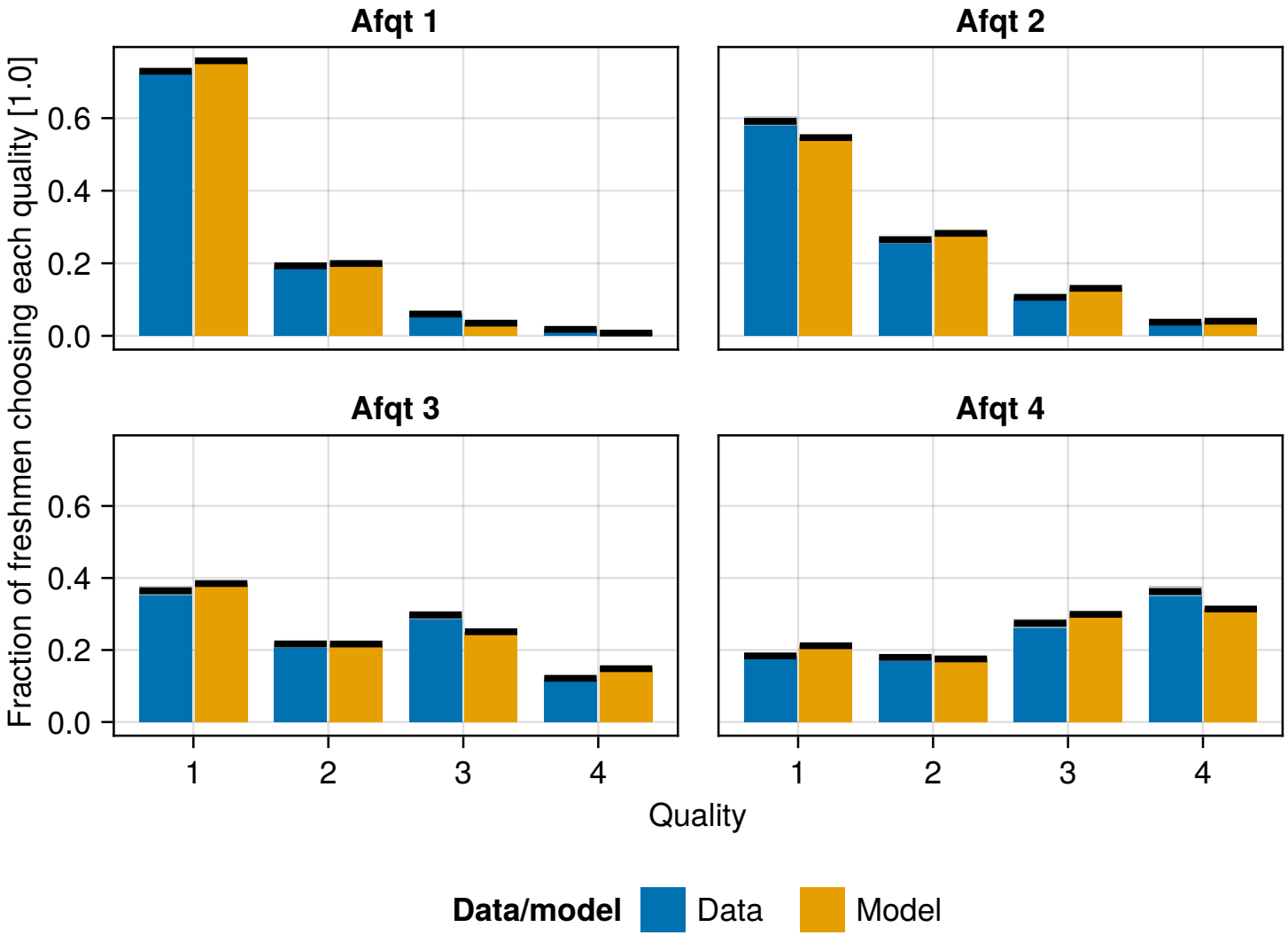
College progress:

- dropout and graduation rates by year and (q,g,p)

Earnings by education and (q,g,p)

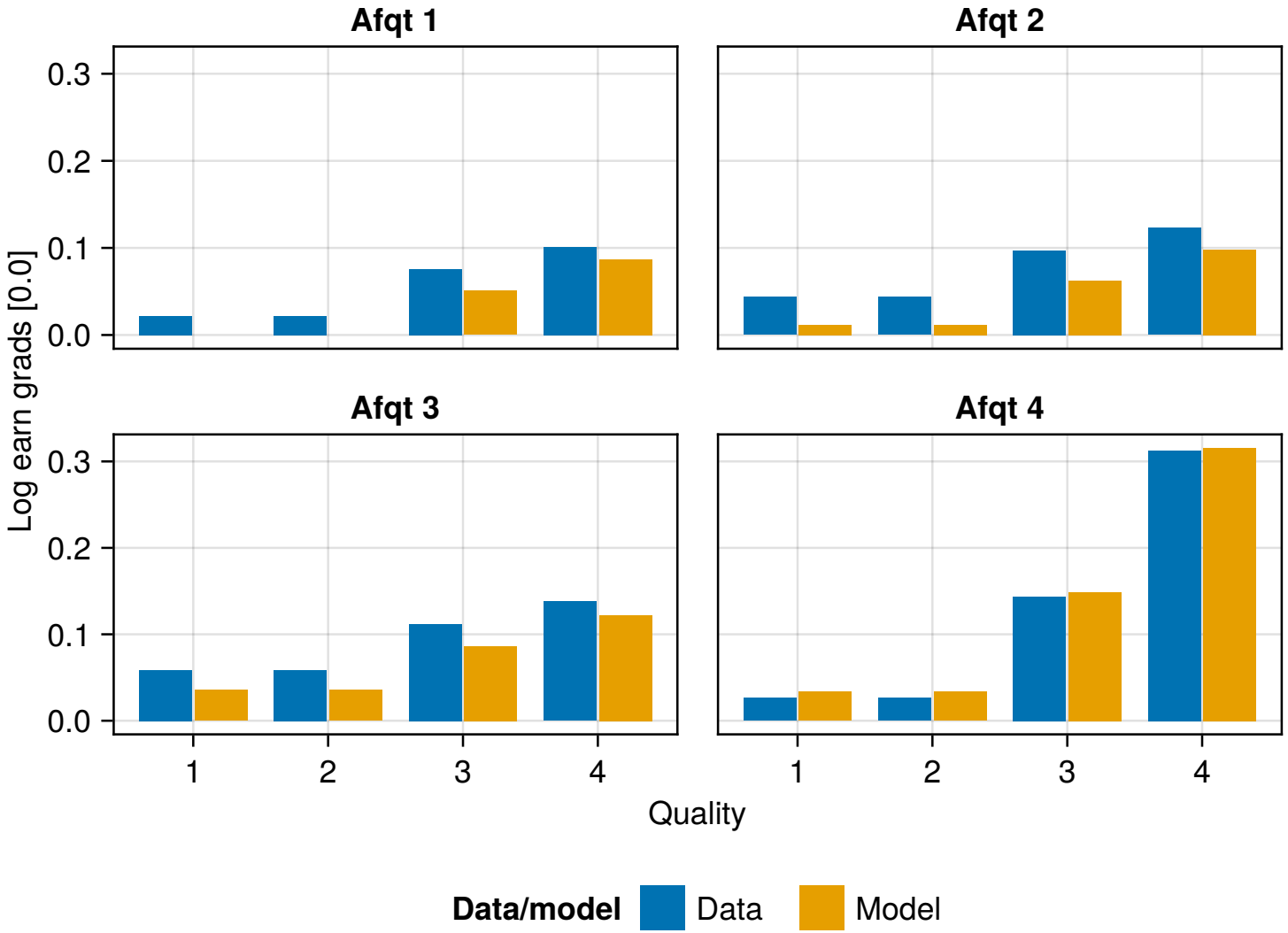
(q,g,p) = (quality, AFQT, parental) quartile

Fit: Quality Choice



Most high ability students do not attend Q4 colleges.

Fit: Graduate Earnings



Complementarity:

- high ability students benefit most from high quality colleges.

Results

	Base	**Change** (pct)	
IBA boost (pct)	0	20	30
College entry rate	57.2	−0.1	+0.3
Graduation rate	41.3	+0.1	−0.6
Aggregate mean log LTY	6.3	+0.1	−0.1
LTY 90/10 gap	93.3	−0.4	−2.5
IG Mobility			
Correl. parental/child LTY percentile	55.7	−13.2	−23.7
LTY gap top/bottom parental quartile	32.0	−9.4	−16.6
Probability LTY quartile ...			
top to top	47.8	−7.9	−13.6
bottom to top	7.1	+6.9	+12.6

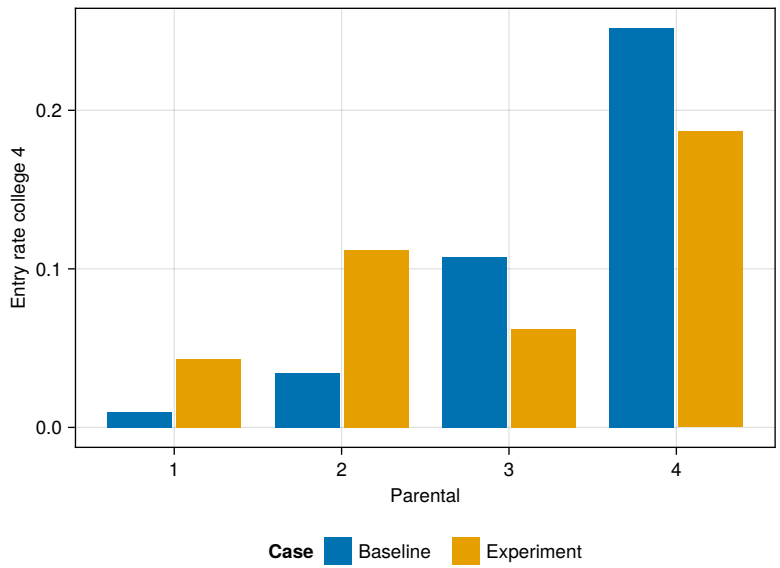
LTY = lifetime earnings

Key result: **Only IG mobility changes with IBA**.

Intuition: Aggregate Earnings

Consider boost fraction 20 percent.

Top quality entry rates change massively:



Therefore: big changes in **IG mobility**.

But **mean ability** of students who move up vs down are almost the same

Therefore: mean ability by college quality is almost unchanged.

Intuition: Mean Abilities

Why doesn't IBA change mean ability in the best colleges?

There is a large pool of high ability, low income students

- about 20 percent of low income students are in top ability quartile
- to match empirical joint distribution of parental / AFQT

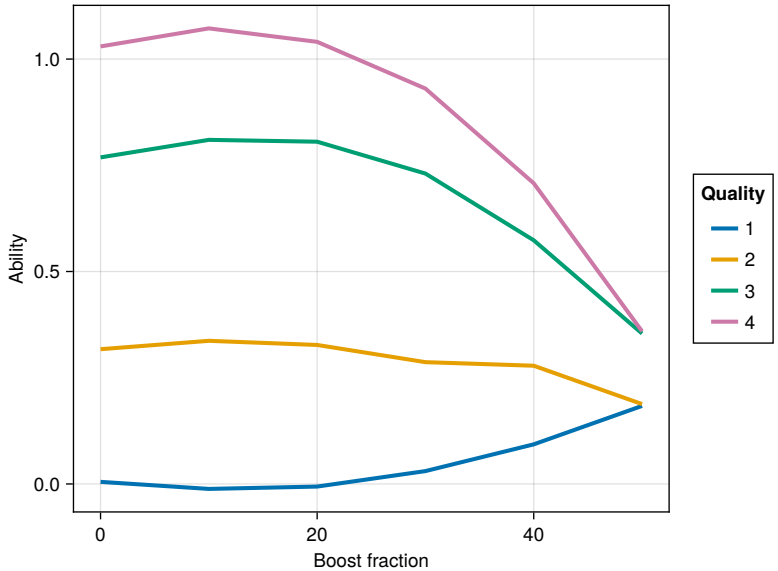
Most don't attend the top college

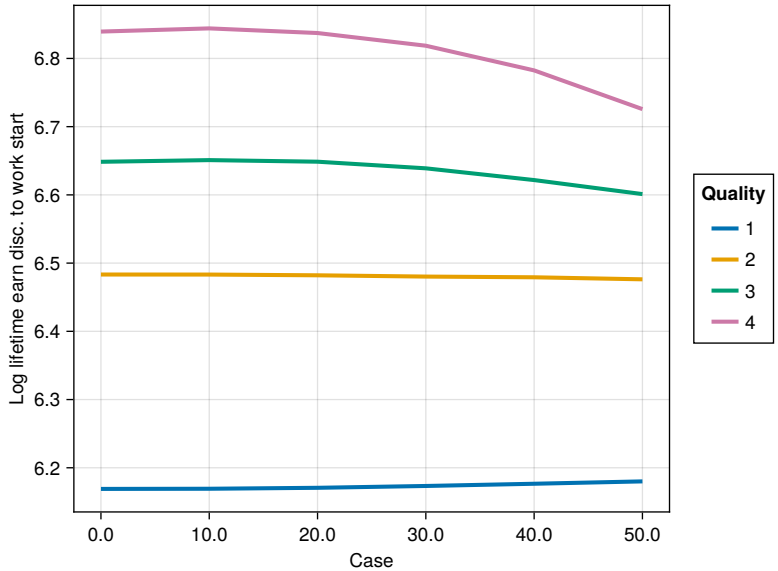
- baseline: only about 10 percent

The first students admitted under IBA are these students

They are of higher ability than the marginal high income students already enrolled in the top college

Intuition: Scaling IBA Up





With large boost fraction:

- Mean student abilities decline in all 4 year colleges.

Only top quality colleges lose significant earnings.

- due to ability / quality complementarity

But they only account for about 10 pct of all workers.

- therefore: aggregate earnings loss still smallish (0.5 pct)

Robustness

Peer effects

- Idea: Learning depends on average ability of peer students.
- No good evidence to calibrate strength of peer effects.
- We assume: Half of differences in human capital productivity across colleges are due to peer effects.
- Results: essentially the same as baseline.

Conclusion

Because many low income students are "undermatched"

IBA mainly benefits **high ability**, low income students.

Modest scale IBA swaps poor for rich high ability students.

- Big changes in IG mobility
- Small changes in aggregate earnings, graduation rates, etc.

Details